

Stone Age and Early Metal Period Archaeology and Settlement Patterns in the Lake Pyhäjärvi Micro-Region, Karelian Isthmus, Russia

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Abstract

Recent Finnish-Russian research cooperation on the Karelian Isthmus, north-west Russia, has completely changed views on the area's prehistory. In this paper we describe the methodology and results of archaeological field surveys and test excavations carried out in the so-called Lake Pyhäjärvi micro-region in 2005–2008. In the course of the project's field studies, the number of Stone Age and Early Metal Period sites in the area increased tenfold, and the exceptional, well-stratified settlement site of Kunnianniemi with nearly three-metre-deep archaeological deposits was located. Recent studies provide reference material for the recently studied nearby areas and a working framework for further inquiries related to, for instance, the spatio-temporal changes in the settlement pattern, material culture, subsistence base, socio-cultural structure, and contact networks.

1 Introduction

The Karelian Isthmus, located at the north-western border of the Russian Federation, was one of the focal points of Finnish archaeological research in the early 20th century, but was ceded to the Soviet Union after World War II (WWII). Subsequently it laid archaeologically fallow for decades and became more accessible again only after the collapse of the Soviet Union in 1991. The new opportunity to study the Karelian Isthmus interested archaeologists from both sides of the border. Since the first entries in the late 1990s, a solid Finnish-Russian Stone Age research cooperation has

developed, changing thoroughly our knowledge of the area's prehistory (e.g. Forsberg 2006; Lavento et al. 2008; Nordqvist et al. 2009a; Takala 2005).

In this paper we present one such joint research project. The *Lake Pyhäjärvi – Ozero Otradnoe* project, directed by the authors, studied the Lake Pyhäjärvi (Ru. *ozero Otradnoye*) micro-region on the eastern Karelian Isthmus in 2005–2008 (Fig. 1). The archaeological fieldwork and environmental studies carried out in this area have fully transformed the character of this former archaeological *terra incognita* (Gerasimov et al. 2007; 2008; Seitsonen et al. 2009). The focus of the project was predomi-



Figure 1. The location of the Lake Pyhäjärvi micro-region (red outline) (top); and view over the large Lake Pyhäjärvi situated in the heart of our research area, seen from the submerged Stone Age–Early Metal Period site of Keljanlahti 1 (bottom). Illustration and photo: O. Seitsonen.

nantly on the Stone Age and the Early Metal Period, but also antiquities from other periods were recorded and studied when encountered (see Table 1 for the periodisation).

This paper starts with a brief outline of the research-historical background and the environmental context of our research area. Then we describe the methods used in planning and carrying out field surveys in 2005–2008, summarise the survey results, and present the outcome of test excavations conducted in 2006. Lastly, the settlement patterns in the Lake Pyhäjärvi micro-region are discussed. The more extensive excavations (2007) and palaeoenvironmental research (2006–2007) carried out within the project will be presented in detail elsewhere.

2 The role of the Karelian Isthmus in Finnish Stone Age archaeology

Starting in the early 1890s, the very first excavations of a Stone Age site in Finland were carried out on the Karelian Isthmus (Ailio 1909: 166–170; Nordqvist & Lavento 2008: 147). In the early 20th century, the area witnessed an extraordinary burst of pioneering archaeological research and became the central stage for some of the most energetic archaeological fieldwork activities ever undertaken in Finland (e.g. Pälsi 1915; 1918). The importance of the Karelian Isthmus for Finnish Stone Age archaeology derives largely from the fact that not only was archaeological field methodology developed here, but also many of the general concepts and (stereotypical) views of the Finnish Stone Age

came into being through the discoveries made in this area. However, studies on the Karelian Isthmus were cut short by WWII (see Huurre 2003; Nordqvist et al. 2009a; Uino 2003a).

Finnish archaeologists started working in the ceded areas as soon as it became possible during the Glasnost of the late 1980s. The initial cooperation concentrated largely on Iron Age and later periods (Uino 1997: 42; 2003a: 145), while Stone Age research commenced in earnest only in the final years of the 20th century. Since then, several Finnish-Russian projects have been carried out by various institutions, e.g. the Lahti City Museum and Mikroliitti Ltd. (Jussila & Matiskainen 2003; Takala 2004; 2005; Takala & Gerasimov 2014), as well as the Museum of North Karelia (Forsberg 2006), in collaboration with partners from different branches of the Russian Academy of Sciences (RAS).

One of the most extensive Stone Age and Early Metal Period research programmes on the Karelian Isthmus was launched in 1998 by the Department of Archaeology, University of Helsinki, in cooperation with two St Petersburg-based research institutes of the RAS, the Institute for the History of Material Culture and the Peter the Great Museum of Anthropology and Ethnography, Kunstkamera (see Lavento 2008; Nordqvist et al. 2009a: 28). These studies concentrated mostly in the former Finnish municipalities of Kaukola (Ru. *Sevast'yanovo*), Räisälä (Ru. *Mel'nikovo*), and Kirvu (Ru. *Svobodnoye*), and resulted in locating hundreds of new Stone Age sites in 1998–2005 (Gerasimov et al. 2006; Halinen & Mökkönen 2009; Lavento et al. 2006; Mökkönen 2011).¹

Immediately south of these newly-studied areas, the Lake Pyhäjärvi region remained a white spot on the Stone Age and Early Metal Period site distribution maps. This was obviously the result of uneven research, but could there also have been other factors at play? These questions attracted our attention and were among the first drivers in establishing the *Lake Pyhäjärvi – Ozero Otradnoe* project.

3 The Lake Pyhäjärvi micro-region

3.1 Location and environment

The Lake Pyhäjärvi micro-region is situated on the western shore of Lake Ladoga, in the eastern part of the Karelian Isthmus (Fig. 1). The research area was set along the natural boundaries formed in the north and west by the Vuoksi River (Ru. *reka Vuoksa*), in the south by Lake Suvanto (Ru. *ozero Sukhodol'skoye*), and in the east by Lake Ladoga. To gain a more coherent archaeological picture, additional tracts on the southern shore of Lake Suvanto were included in the study area, which covers altogether ca. 1500 km². Consisting mostly of the former Finnish municipalities of Vpl. Pyhäjärvi and Sakkola (current centres *Plodovoe* and *Gromovo*), the research area also includes parts of Metsäpirtti (Ru. *Zaporozhskoye*), Rautu (Ru. *Sosnovo*), Räisälä, Valkjärvi (Ru. *Michurinskoye*), Vuoksela (pre-WWII municipal centre uninhabited), and Käkisalmi rural municipality (Ru. *Priozersk*).

Large lakes, such as Lake Kiimajärvi (Ru. *ozero Komsomol'skoye*), Lake Suvanto, and especially the horseshoe-shaped Lake Pyhäjärvi in the centre of the micro-region, strongly characterise our research area. On the other hand, it is typified by a topographically varying forest landscape and scattered isolated small lake basins and ponds, as well as high altitude differences ranging from the level of Lake Ladoga (ca. 5 m a.s.l.) to over 90 m a.s.l. in the central parts. Water levels and shorelines have fluctuated throughout the millennia in accordance with the large-scale changes in the Vuoksi River catchment and Lake Ladoga (see Saarnisto 2008; Subetto 2009 for recent summaries), and played an important role in the settlement and subsistence of prehistoric people.

3.2 Previous archaeological research in the area

Up to 2005 the Lake Pyhäjärvi micro-region was mostly a blank spot on archaeological site distribution maps (see Appendix 1). In the 20th

century, archaeologists made only a few visits to Pyhäjärvi, almost all of them connected to the study of the Iron Age or later periods (Lapshin 1995: 172; Schwindt 1893: 93; Uino 1997: 23–40; 2003a). However, thanks to the enthusiastic activity of antiquities-collecting laymen, large quantities of prehistoric stray finds had been accumulating from the area since the mid-19th century to the collections of the National Museum of Finland. Over 700 catalogue numbers of such stray finds were submitted from the former municipalities within our research area (Pyhäjärvi: 263; Metsäpirtti: 237; Sakkola: 209; Valkjärvi 38; Käkisalmi: 23; Rautu: 13; Vuoksela: 2; see Nordqvist 2005; 2006; 2013; Uino 2003b). Even if these numbers are meagre compared to the neighbouring municipalities of Kaukola and Räisälä, with ca. 6000 and 1700 catalogue numbers of finds respectively (see Nordqvist 2005), the finds from Pyhäjärvi alone rank as the third largest ‘municipal’ collection of Stone Age stray finds from the Karelian Isthmus in the Finnish National Museum.

Figure 2 shows the accumulation of stray finds from the research area through time and categorised according to the main artefact types. On typological grounds, the stray finds cover all phases of the Stone Age, starting with some Mesolithic artefact types and continuing to the Late Neolithic and Early Metal Period (and even later). Finds have been collected throughout the study area, although there are distinctive concentrations around the basins of Lakes Kiimajärvi and Pyhäjärvi, especially on their northern shores (see Nordqvist 2006: 192). Numerous finds were also collected along the shores of Lake Suvanto and its confluence with the Vuoksi River, the Kiviniemi Rapids (in present-day *Losevo*), as well as around the Taipaleenjoki River (Ru. *reka Burnaya*), through which Lake Suvanto currently discharges into Lake Ladoga (Nordqvist 2013: 19–20). No significant temporal differences can be distinguished in the distribution of stray finds, although it is noteworthy that basically all ceramics and chipped lithics originate from just two settlement sites, Konnitsa

Äijö (P1; numbering refers to Appendix 2) and Kiviniemi Valkjärvi (S2), and that approximately one third of all the finds from Pyhäjärvi derive from Äijö or its immediate vicinity.

Only a few prehistoric settlement sites were discovered in the research area in the 20th century. Sakari Pälsi inspected a find location reported by the locals at Äijö in 1934 and two years later excavated some 80 m² in just three days (Pälsi 1937; also Nordqvist & Seitsonen 2008a: 18–19). Analyses of find material have shown that the site was used throughout the Neolithic Stone Age and probably also in the Mesolithic and Early Metal Periods (Huurre 2003: 156; Nordqvist 2006: 195–196).

The southern part of the research area, Sakkola municipality, was visited a bit more often by archaeologists, although also there the studies concentrated almost entirely on the Iron Age (Lapshin 1995: 167–172; Saksa 1985; Schwindt 1893: 81–91; Uino 1997: 23–40; 2003a). In 1920, Aarne Äyräpää (Europaeus) inspected the site of Kiviniemen koski (S1), but due to the low number of finds – some lithics, burned bone fragments, and a few morsels of pottery – he felt reluctant to call it a settlement site, although nowadays it would qualify as one (Europaeus 1920; 1925: 37; also Nordqvist 2013: 18). Recent inspection showed that this site has been totally eroded by the Kiviniemi Rapids.

In 1929, Äyräpää was back in Sakkola, this time investigating the site of Kiviniemi Valkjärvi (S2) due to some finds located at a garrison area of the Finnish Defence Forces. He opened a couple of excavation trenches on the southern shore of the small Lake Valkjärvi (Ru. *ozero Sapernoye*) with rather few finds, namely just one Typical Comb Ware vessel broken *in situ*, some quartz implements, and burned bone fragments. Äyräpää interpreted the scarce finds as representing short-term occupation, probably a temporary fishing camp (Europaeus 1929; also Nordqvist 2013: 17–18). This study is one of the earliest examples in which the utilisation and importance of small lakes during the Stone Age was noted on the Karelian Isthmus or more generally in Finland.

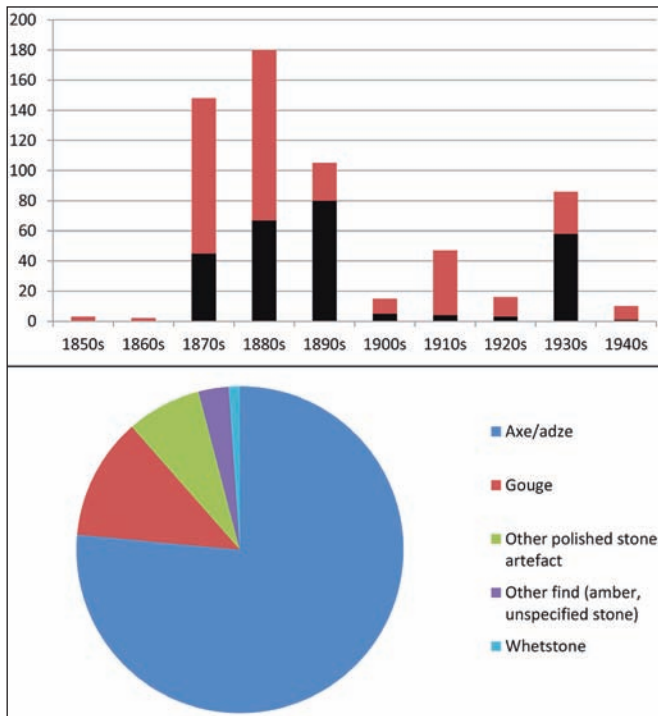


Figure 2. Stray finds from the former Pyhäjärvi municipality (black) and from the other areas in our research area (red), accumulation by decade (top); and by artefact types (not including ceramics and chipped lithics) (bottom).

A gap of more than 30 years followed before Professor S. I. Rudenko of the RAS recommenced archaeological research in the area with excavations at Metsäpirtti in 1961–1962. He studied altogether 117 m² at the Vyun 1 site (M1), situated along the Viisjoki River (Ru. *reka Vyun*), and located materials characterised mostly by Typical Comb Ware, albeit also organic-tempered pottery was recognised (Rudenko 1970: 43–47; also Lapshin 1995: 172). On the opposite side of the river, at the site of Vyun 2 (M2), both Typical Comb Ware and organic-tempered ceramics were discovered (Gerasimov et al. 2003: 45; Lapshin 1995: 172).

In 2003, visits to the Lake Suvanto area were made during archaeological rescue surveys by our colleagues S. N. Lisitsyn, S. V. Belskiy, and A. I. Murashkin, who located two new sites (V1, S3) (Gerasimov et al. 2003: 170–180). Encouraged by this visit, in 2004 two of the current authors (O. S. and D. G.) with S. Seitsonen paid a brief visit to the Lake Pyhäjärvi micro-region in connection with the

above-mentioned Kaukola–Räisälä studies. This visit of a mere few hours proved fruitful: the Äijö site was inspected and one more site located on the way (P2) (Halinen & Mökkönen 2004: 191–194). Thus, the large amount of stray finds, the few intriguing early archaeological studies and visits, and the recent 21st-century research in the neighbouring areas all suggested that the Lake Pyhäjärvi micro-region held high potential for comprehensive and comparative studies.

4 The Lake Pyhäjärvi – Ozero Otradnoe Project

4.1 Background and conducted studies

Launching the project was preceded by several years of continuous fieldwork in the neighbouring areas, mostly Kaukola and Räisälä, in which the authors took part from the beginning. One aim of the project was to continue this research by widening the spatial scope

to the south and hereby collecting reference material. Further, the meagrely known past of the micro-region spurred the authors to team up with natural scientists in order to study the shoreline displacement and environmental history of the area. Palaeogeography seemed especially tempting, as several ecological niches were present in the region: terrestrial, inner lake, and fjord-like environments, as well as the open coasts of sea-like Lake Ladoga. Such a situation would have provided a variety of environments and resources for prehistoric people and also gave us an opportunity to study differences between sites situated in diverse environmental settings.

To answer these questions and meet these aims, the research area was visited yearly between 2005 and 2008. The studies included an intensive judgemental survey in 2005 (Seitsonen et al. 2005), complementary surveys in 2006 and 2008 (Nordqvist & Seitsonen 2007; Nordqvist et al. 2009b), palaeoenvironmental sampling in 2006–2007 (Gerasimov et al. 2007), test excavations in 2006 (Nordqvist et al. 2008a; 2008b; 2008c), and additional excavations at the Kunnianniemi site (Komsomol'skoye 3; P15) in 2007 (see Gerasimov et al. 2007; 2008; Nordqvist & Seitsonen 2009; Seitsonen et al. 2009).

4.2 Archaeological surveys in 2005–2008

Field surveys carried out in different years varied in terms of intensity and coverage. The survey in 2005 covered the largest area in order to get a general idea of the prehistory and antiquities of the research area. Later surveys were complementary, covering less ground but being locally more intensive. Survey methods followed the standards developed in Finland during the past few decades (see Maaranen & Kirkinen 2000) and used also in recent studies elsewhere on the Karelian Isthmus (Lavento 2008: 60–64).

Survey work was based on environmental reconstructions generated using GIS software, the spatial distribution of stray finds, and the research team's familiarity with the archaeol-

ogy of adjoining areas. Preparatory work was based mostly on digitised Finnish topographic maps (scale 1:20,000) measured in the early 20th century², geological maps of Quaternary deposits, and the Aster Digital Elevation Model (DEM). The old Finnish topographic maps currently offer the most detailed publicly available cartographic material on the Karelian Isthmus, especially in terms of elevation data, and they were also used to correct some obvious mistakes and inconsistencies in the Aster DEM. Large-scale Finnish and Russian geological maps were combined, and different forms of GIS data from various providers were utilised for preparing the environmental reconstructions.

Subsequently, predictive models about archaeological site locations were prepared based on the combined GIS database, using data from the Lake Pyhäjärvi micro-region and the adjoining municipalities as baseline training data and experimenting with various modelling algorithms, such as Mahalanobis and Generalised Additive Models (see Kvamme 2006) (Fig. 3). These models are intended as an exploratory tool for the severely under-resourced Cultural Resource Management work on the Karelian Isthmus and will be discussed elsewhere in full detail.

Fieldwork was carried out in the form of un-systematic judgemental surveys based on intensive test pitting and inspections of all open soil patches in the thickly-forested research area. This is the most common way of conducting surveys in both Finnish and Russian archaeology; systematic or un-systematic sampling has very rarely been applied, and even then with rather unresolved results. During the four field seasons, an area of ca. 8.5 km² was covered by surveys; the surveyed areas are mapped in Appendix 3. This equals ca. 1% of the suitable modern land surface, excluding swamps and bedrock areas. Mirrored against the prehistoric water level situations, this covers ca. 2% of the suitable land surface during both the Ancyclus and Lake Ladoga transgression maximums (ca. 8100 and before ca. 1350 BC respectively; Saarnisto 2008: 134, 136).

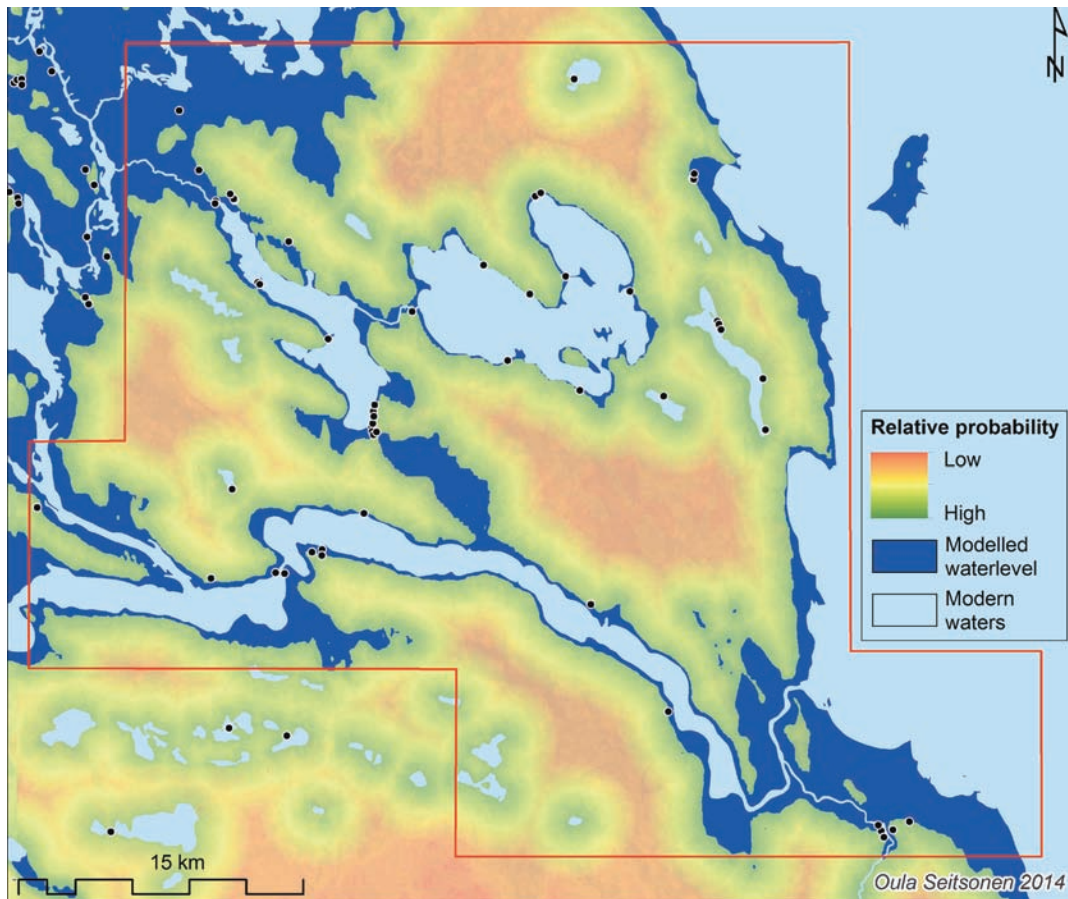


Figure. 3. An example of the predictive models of site location prepared for the Karelian Isthmus and designed as an aid for the CRM work: Generalised Additive Model (GAM) for the Late Neolithic period. Illustration: O. Seitsonen.

Since hunter-fisher-gatherer sites are often shore-bound (but see Jussila & Kriiska 2006; Mökkönen 2011: 67–69; Nordqvist & Seitsonen 2008b: 224), comparison between the length of the shoreline at different times and the track covered on foot along these palaeoshorelines is also meaningful. Slightly less than 60 km were hiked along the shore formations during the surveys (based on GPS tracking and mapped survey areas), which equates to ca. 19% of the reconstructed shorelines of the *Ancylus* transgression maximum and ca. 15% of the Lake Ladoga transgression maximum shores.

Because fieldwork was started practically from zero, even several weeks of survey work do not warrant speaking of any completely sur-

veyed areas. Still, a relatively good sample has been covered, even if there are spatial differences in the sample's representativeness. Around Lakes Kiimajärvi and Yläjärvi (Ru. *ozero Gusinoje*) the sample can be considered representative, but in other areas fieldwork concentrated in the most obvious regions and marginal areas were left aside. Around Lake Suvanto and along the coast of Lake Ladoga, the sample is more random due to the drastically shorter fieldwork time spent there; in addition, at places the field observations were severely limited by factors related to recent land use, such as wide WWII battlefield destruction, inaccessible military areas, inoperable roads, and freshly sprung-up fenced summer cottage areas.

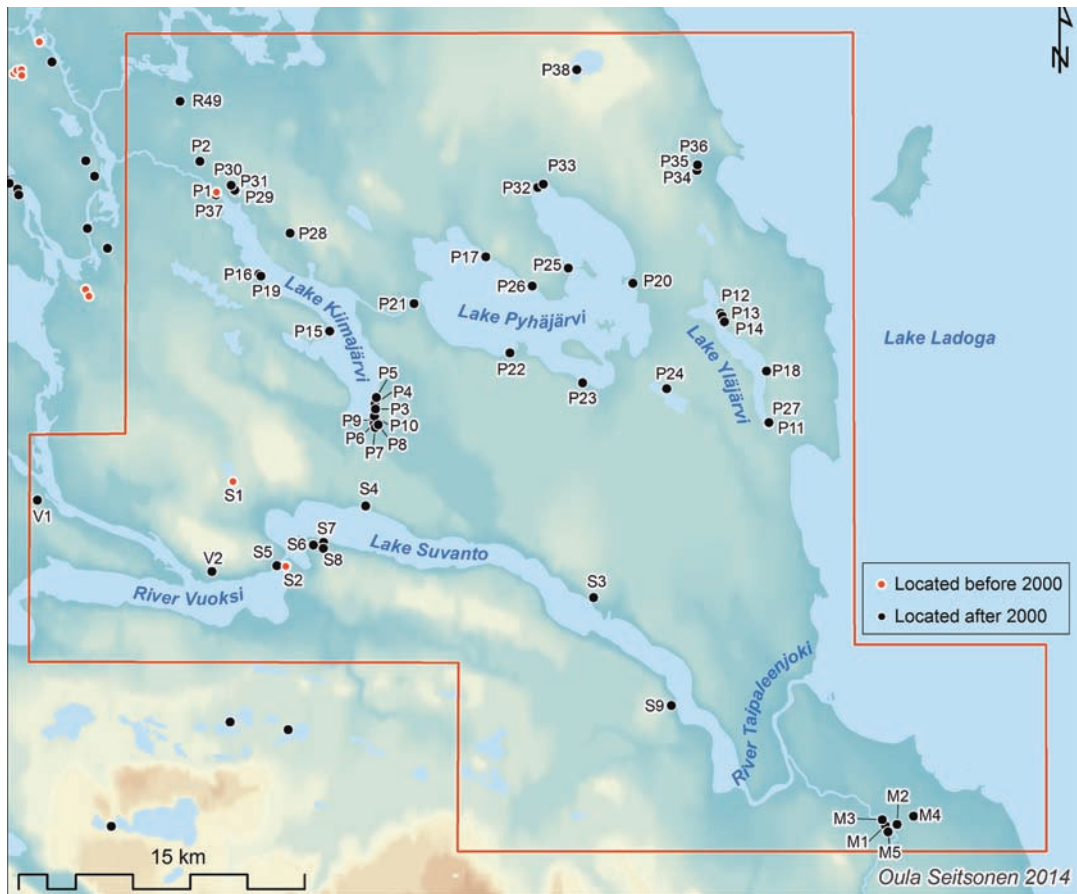


Figure 4. Stone Age and Early Metal Period archaeological sites discovered in the Lake Pyhäjärvi micro-region and its surroundings in surveys conducted in the 20th century (red) and the 21st century (black); the numbering refers to Appendix 2. Illustration: O. Seitsonen.

4.3 Results of the project's surveys

Over 50 new Stone Age and Early Metal Period sites were located in our surveys and all the previously known sites were visited (Fig. 4). In addition, five sites dating to the Iron Age, the Middle Ages, and later times were found, and numerous WWII defences mapped alongside other fieldwork. Surveys balanced specifically the ratio between Stone Age–Early Metal Period sites and later sites: earlier the latter largely dominated the area's archaeology.

Most of the newly-located sites are small quartz lithic scatters, as is typical also in the surrounding areas (e.g. Halinen & Mökkönen 2009;

Nordqvist et al. 2008d); the most common find category was, nevertheless, burned bone fragments. As these kinds of finds are chronologically nondescript, roughly half of the sites were given a general Stone Age–Early Metal Period dating (Appendix 2). However, recent excavations on the Karelian Isthmus have shown that despite meagre beginnings, such sites can turn out to be very rich in finds (Gerasimov et al. 2006; Mökkönen et al. 2007; 2009; Seitsonen et al. 2009). Ceramics were encountered at a relatively high percentage of sites, at 17 find locations (Fig. 5). Altogether 18 individual sites can be assigned more specifically to different phases of the Stone Age and Early Metal Period, includ-



Figure 5. Stone Age and Early Metal Period ceramics from the Lake Pyhäjärvi micro-region: a–b – Pit-Comb Ware and Early Comb Ware (Sperrings); c–e – Typical Comb Ware; f – Comb Ware; g–j –organic-tempered Corded Ware; k–n – Late Neolithic organic-tempered pottery; o–q – Late Neolithic pottery tempered with asbestos, chamotte, sand, and organic admixture; r–s – Late Neolithic asbestos-tempered pottery; t–u – Corded Ware with textile impressions; v – Early Metal Period pottery. Sites of origin: a–d, r, v – P15; f – P16; e, g–j, s–u – P11; k–n – P3; o–q – P14. Illustration: O. Seitsonen & K. Nordqvist.

Period	calBC/AD	Site contexts*
Early Mesolithic	8600–7000 calBC	3
Late Mesolithic	7000–5500 calBC	5
Early Neolithic	5500–4000 calBC	4
Middle Neolithic	4000–3000 calBC	11
Late Neolithic	3000–1800 calBC	8
Early Metal Period	1800 calBC–calAD 300	3

Table 1. Dating of archaeological sites in the research area. The chronology is based on Seitsonen et al. (2012), with the beginning of the Early Neolithic pushed back to 5500 BC based on two newly acquired radiocarbon dates of charred crust on potsherds (Ua-43978 and Ua-43979, both corrected for apparent reservoir effect). * – 18 sites can be dated by period, including 6 multi-period sites, which are classed here by their individual contexts.

ing six multi-period sites utilised over several millennia (Table 1).

The surveys brought into light also the first Stone Age house pits (remains of semi-subterranean dwellings) in the research area. House pits have been recognised on the Karelian Isthmus only since 1999, although they were known earlier in large numbers from the adjoining areas in Finland and Russia (Mökkönen 2002; 2011; Mökkönen et al. 2007; Nordqvist & Lavento 2008; Pesonen 2002; Zhul'nikov 2003). House pits were located at four sites on the shores of Lake Kiimajärvi and at one site on Lake Yläjärvi. Three sites contained multiple house pits: Porsaanmäki 1 (Komsomol'skoye 9; P3) had three, Muurisuo (P2) had two, and Kunnianniemi had at least two house pits. The sites of Vanhasniemi 1 (Gusinoye 2; P12) and Porsaanmäki 2 (Komsomol'skoye 10; P4) both have one house pit. Other structures visible on the surface included occasional hunting and storage pits.

Sites were classified into two functional categories based on heuristic dichotomous categories suggested by K. L. Kvamme (1985) – to facilitate comparison, the classification criteria closely follow those used in the neighbouring areas (Nordqvist & Lavento 2008; Seitsonen & Gerasimov 2008). Sites with finds from multiple find categories, visible structures, and/or a clear cultural layer were classified as extended activity sites (N=17), while the rest were ranked as limited activity sites (Fig. 6).

The archaeological surveys also provided significant evidence of previously unknown

changes in water level in some parts of the micro-region. For instance, the conspicuous absence of sites around Lake Pyhäjärvi, in contrast to our presuppositions, is explained by the fact that the water level in the lake has risen during the 20th century, submerging and severely eroding shore-bound sites. This was later corroborated by old Finnish informants' recollections. Evidence of eroded sites was located especially on the southern shore of the lake (sites P23, P25), whereas inundated sites were found in the north (sites P32, P33; see Fig. 1). Where discernible, the find layer seems to lay ca. 50 cm below the current water level; remains of possible washed fireplaces, i.e. clusters of fire-cracked rocks, were documented in the shallow shore waters at the Keljanlahti 1 site (P32).

4.4 Test excavations in 2006

Test excavations were carried out at six sites in 2006, including the sites of Porsaanmäki 1, Ristilä 1a (Gusinoye 6; P11), Vanhasniemi 1, Vanhasniemi 3 (Gusinoye 4; P14), Kunnianniemi, and Ristilä 1b (P27). In the following we briefly describe the general results of these excavations (presented in more detail in Appendix 4).

Four of the excavated sites are situated in the Lake Yläjärvi environs (P11, P12, P14, P27), on the eastern shore of the lake. Excavations showed that several different site types are present within a fairly small area. One of the sites (P11) appears to be a multi-period extended activity site with numerous finds and distinc-

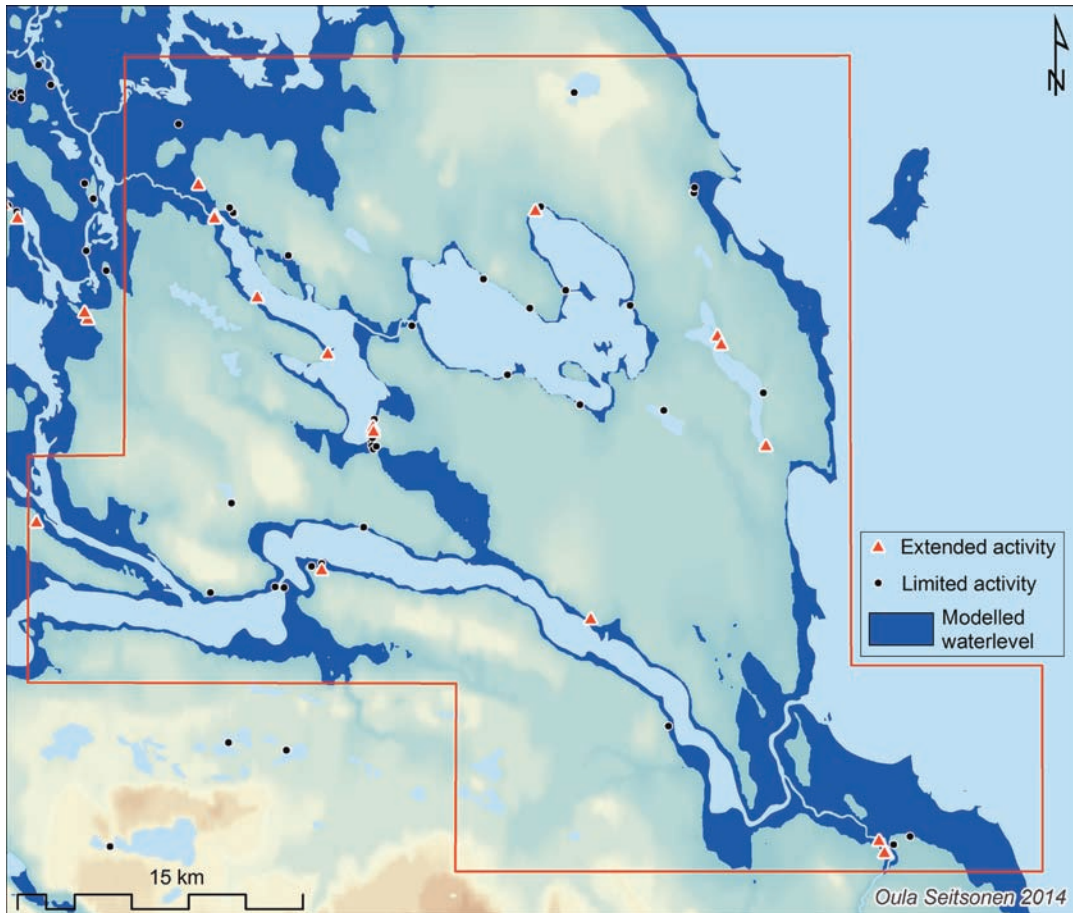


Figure 6. Stone Age and Early Metal Period archaeological sites in the Lake Pyhäjärvi micro-region: red triangles represent the extended activity sites and black dots the limited activity sites. The water level is reconstructed to the level of the Lake Ladoga transgression maximum. Illustration: O. Seitsonen.

tive cultural deposits, two sites (P12, P14) are single-period extended activity sites with fewer finds and thinner cultural layers, and one location (P27) seems to be a small limited activity site, despite a textbook example of a pit hearth uncovered there (see Appendix 4: Figs. 7–9). The diversity of ceramic and other finds from the sites is interesting and tells of the longevity of habitation at Lake Yläjärvi: human presence begins at the latest during the Early Neolithic (or already during the Mesolithic, based on radiocarbon dating) and continues to the Early Metal Period.

Two excavated sites are located in the Lake Kiimajärvi area: Porsaanmäki 1 at its southern

end and Kunnianniemi on the western shore. Both of these are large extended activity sites with house pits. At Porsaanmäki 1, trenches revealed at least two occupation phases: the earliest is Mesolithic on the basis of lithic technology and raw material, the later Late Neolithic according to pottery and a radiocarbon dating (Appendix 4: Fig. 8; see also Seitsonen et al. 2012). In addition, studies revealed evidence of shoreline changes: the lowest house pits at the site had been submerged by the Lake Ladoga transgression. At Kunnianniemi, nearly three-metre-deep, well-stratified archaeological deposits, sealed by sterile transgression layers, were unearthed in the excavations,

making it one of the most interesting sites discovered lately on the Karelian Isthmus. The occupational sequence at the site, based on the finds and radiocarbon dates, ranges from the Late Mesolithic to the Early Metal Period (Appendix 4: Figs. 8 & 9; also Gerasimov et al. 2007; 2008; Seitsonen et al. 2009; 2012).

5 Overview of the spatial distribution of Stone Age and Early Metal Period sites

Maybe the most eye-catching in the spatial distribution of sites dating to different periods is the apparent stability of settlement patterns – or at least the recurrent use of the same locations – throughout the Stone Age and Early Metal Period. This is exhibited especially well by the large multi-period sites of Kunnianniemi, Äijö, Vyun 1, and Ristilä 1, all used through or during several millennia. These might have served as base-camp-like locations, judging from the range of activities carried out (based on the characteristics of the find material), the observed structures (most prominently house pits), and the well-developed cultural layers. The spatial distribution of these sites can also give some idea of territoriality, assuming they had acted as central places in a settlement-subsistence system. Such recurrently visited and frequently utilised sites might have become landmarks through time, further attracting the re-use of these advantageous localities (Clarkson 2008; von Hackwitz 2010; Zedeño 2000).

Even if the foundation of the settlement-subsistence system might at first glance seem rather stagnant and without abrupt alterations, we must take into consideration the fact that the available material does not allow a coherent picture of any single time-slice, thus making the comparison between different periods complicated. Supporting evidence for the longevity, resilience, and continuity of settlement patterns, nevertheless, comes from studies made elsewhere on the Karelian Isthmus (Halinen & Mökkönen 2009; Nordqvist & Lavento 2008; Seitsonen & Gerasimov 2008). Anyway, the appearance of new cultural influ-

ences and ideas, such as the emergence of new ceramic traditions or the possible introduction of small-scale cultivation (Alenius et al. 2013; Herva et al. 2014; Mökkönen 2010; Nordqvist 2014), must have had some effect, and it is more than likely that the details of settlement patterns evolved numerous times throughout the millennia. The environmental alterations were also influential: sites inundated by the transgressive waters show that shifting water levels forced people out in search of new settlement from time to time, although at least in some places they returned back to the same loci after the waters had subsided (Gerasimov et al. 2008; Seitsonen et al. 2009). Still, it must be noted that our micro-region may be less sensitive to moderate environmental changes than many others: there are no significant alternative settlement locations (assuming that a close connection with water was essential) like in some other well-studied regions, such as the adjoining Kaukola–Räisälä area or the Lake Saimaa region in Finland (e.g. Halinen & Mökkönen 2009; Mökkönen 2002; 2011).

One important result of the *Lake Pyhäjärvi* project is the possibility to connect isolated, small inland lake basins into wider settlement patterns. Such work was pioneered by the observations of Äyräpää at Lake Valkjärvi, and later especially the studies of Dr V. I. Timofeyev exemplified the importance of smaller waterbodies on the Karelian Isthmus and in its surroundings (e.g. Timofeyev 1993). In our micro-region, besides Lake Valkjärvi, also the small basins of Lakes Rahkajärvi (Ru. *ozero Naryadnoye*), Kuoppalampi (Ru. *ozero Borob'yevo*), and Yläjärvi were tied to the settlement-subsistence systems. Sites along these are typically limited activity loci, apparently repeatedly utilised short-term fishing, fowling, or hunting bases (P13, P18, P24, P27, P38), although also more permanent settlement developed at Lake Yläjärvi (P11, P12, P14).

In contrast to the neighbouring areas (see Halinen & Mökkönen 2009; Nordqvist & Lavento 2008; Seitsonen & Gerasimov 2008), no clear-cut division is observable between the spatial distribution of extended and limited ac-

tivity sites in the Lake Pyhäjärvi micro-region. Instead, different kinds of sites are found at small distances from each other within ecologically analogous areas, although extended activity sites are more often situated on the borders of different ecological niches (Fig. 6), a situation analogous to the adjoining areas. Interestingly, these sites are also often situated in the *cul-de-sacs* at the end of waterways (also Halinen et al. 2008) yet still possess good visual control over the approach routes and the immediate vicinity. In the nearby areas, extended activity sites are most often located at the crossroads of waterways (Nordqvist & Lavento 2008: 157; Seitsonen & Gerasimov 2008: 180). This sort of setting has been preferred in our research area in the Kiviniemi–Vuoksela region (V1, S8).

Limited activity localities are found fairly evenly throughout the micro-region. These include also the first Stone Age–Early Metal Period sites discovered on the windswept, exposed open western shore of Lake Ladoga (P34–36, M4); their existence was one of our initial research questions. Some of the limited activity sites also yielded ceramic finds, which may indicate that bulky and heavy ceramic vessels might not have been moved along on the logistical trips, but instead left behind at the temporary fishing-hunting stations. They might represent stationary ‘site furniture’ (Binford 1979) related to anticipatory planning, caching, and conceivably also ownership – on the other hand, they might also show that the dichotomous division into extended and limited activity sites is fairly crude, especially when based on survey observations alone. Be this as it may, it seems evident that other factors than simple subsistence-ecological or accessibility perspectives were at play in the formation of the settlement patterns.

Recent, post-WWII water level changes have affected, and continue to affect, the archaeological site distribution and preservation: the most graphic example of shoreline changes are the recently submerged and eroded sites along the shores of Lake Pyhäjärvi. Also, on the shores of Lake Yläjärvi most prehistoric sites are severely eroded due to a recently-built

fish hatchery, which has raised the water level by 0.5–1 m. Phosphate analyses carried out in 2006 showed that despite the severe erosion, considerable sections of most sites on the shore of Lake Yläjärvi still survive and should receive closer attention before they are swept away by the continuing wave action.

6 Conclusions

The revival of archaeological research on the Karelian Isthmus since the collapse of the Soviet Union has drastically changed the picture of the past of this interesting area. This is clearly evident also in the Lake Pyhäjärvi micro-region on the eastern Karelian Isthmus, where the number of known Stone Age and Early Metal Period sites has increased tenfold in the course of surveys in 2005–2008. Recent archaeological and palaeoenvironmental research offers us a reasonably reliable overview of the cultural developments from the Mesolithic to the Middle Ages, brings into light important information on the various site types and connected material culture, and allows new insights into the environmental and ecological changes through the millennia. In the future, large-scale excavations are necessary to gain a better understanding of the configuration of settlement sites, as well as of the spatio-temporal changes in the settlement pattern, material culture, subsistence base, socio-cultural structure, and contact networks.

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Notes

- 1 Since the majority of old archival material, which was the starting point of the research, was stored according to the old Finnish pre-WWII toponyms, these stayed in use also afterwards. For the same reason, Finnish names are used throughout this paper, and the Russian equivalents are given in parentheses.
- 2 These maps have been available online since the spring of 2009 (www.karjalankartat.fi), published by the National Land Survey of Finland).

Appendix 1

Stone Age and Early Metal Period studies in the Lake Pyhäjärvi micro-region.

Year	Type	Site / study area	Researcher(s)	Reference
1920	Inspection	Kiviniemen koski	A. Europaeus	Europaeus 1920; 1925
1929	Excavations	Kiviniemi Valkjärvi	A. Europaeus	Europaeus 1929
1934	Inspection	Konnitsa Äijö	S. Pälsi	Nordqvist 2006
1936	Excavations	Konnitsa Äijö	S. Pälsi	Nordqvist 2006; Pälsi 1937
1961– 1962	Excavations	Vyun 1, Vyun 2	S. I. Rudenko	Gerasimov et al. 2003; Rudenko 1970
1998	Inspections	Various sites on the Karelian Isthmus	A. Siiriäinen et al.	Siiriäinen et al. 2008
2003	Survey	Southern part of the Lake Pyhäjärvi micro-region	S. V. Belskiy, S. N. Lisitsyn, A. I. Murashkin	Gerasimov et al. 2003
2004	Reconnaissance	Konnitsa Äijö, Konnitsanjoki River (Ru. <i>reka Vese-laya</i>) valley	Current authors	Gerasimov et al. 2006; Halinen & Mökkönen 2004
2005	Survey	Lake Pyhäjärvi micro-region	Current authors	Gerasimov et al. 2007; Seitsonen et al. 2005
2006	Excavations, survey	Six sites in the Lake Pyhäjärvi micro-region	Current authors	Gerasimov et al. 2007; Nordqvist & Seitsonen 2007; Nordqvist et al. 2008a; 2008b; 2008c
2007	Excavations	Pyhäjärvi Kunnianniemi	Current authors	Gerasimov et al. 2007; 2008; Seitsonen et al. 2009
2008	Survey	Lake Pyhäjärvi micro-region	Current authors	Nordqvist 2013; Nordqvist et al. 2009b

Appendix 2

Stone Age and Early Metal Period sites in the Lake Pyhäjärvi micro-region (see also Fig. 4). * – EM – Early Mesolithic; LM – Late Mesolithic; EN – Early Neolithic; MN – Middle Neolithic; LN – Late Neolithic; EMP – Early Metal Period; ** – CW1 – Early Comb Ware; CW2 – Typical Comb Ware; CW3 – Late Comb Ware; EAW – Early Asbestos Ware; Org – Middle–Late Neolithic organic-tempered ceramics; Asb – Middle–Late Neolithic asbestos-tempered ceramics; CoW – Corded Ware; TXT – Textile Ware; † – 1 – Extended activity site; 2 – Limited activity site (sensu Kvamme 1985).

Old municipality	No	Site name (Fi.)	Site name (Ru.)	Site type	Located	Dating 1	Dating 2*	Find material**	House pits	Site type†
Pyhäjärvi	P1	Äijö	-	Site	1934	Multi-period	EM?; LM?; EN; MN; LN; EMP	Lithics (incl. flint blades); CW1; EAW; CW2; CW3; Asb (Pöijä); Org	?	1
Pyhäjärvi	P2	Muurisuo	-	Site	2004	Neolithic		Lithics; ceramics	2	1
Pyhäjärvi	P3	Porsaanmäki 1	Komsomol'skoye 9	Site	2005	Multi-period	EM; LN	Lithics (incl. flint blades); Org; burned bone	3	1
Pyhäjärvi	P4	Porsaanmäki 2	Komsomol'skoye 10	Site	2005	Neolithic	MN?	Lithics; ceramics; burned bone	1	1
Pyhäjärvi	P5	Porsaanmäki 3	Komsomol'skoye 11	Site	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P6	Kakoralampi 1	Komsomol'skoye 4	Site	2005	Stone Age–Early Metal Period		Lithics; burned bone	No	2
Pyhäjärvi	P7	Kakoralampi 2	Komsomol'skoye 5	Site	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P8	Kakoralampi 3	Komsomol'skoye 6	Site	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P9	Likolampi	Komsomol'skoye 7	Site	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P10	Camp Sverdlöv	Komsomol'skoye 8	Site	2005	Stone Age–Early Metal Period		Lithics	No	2

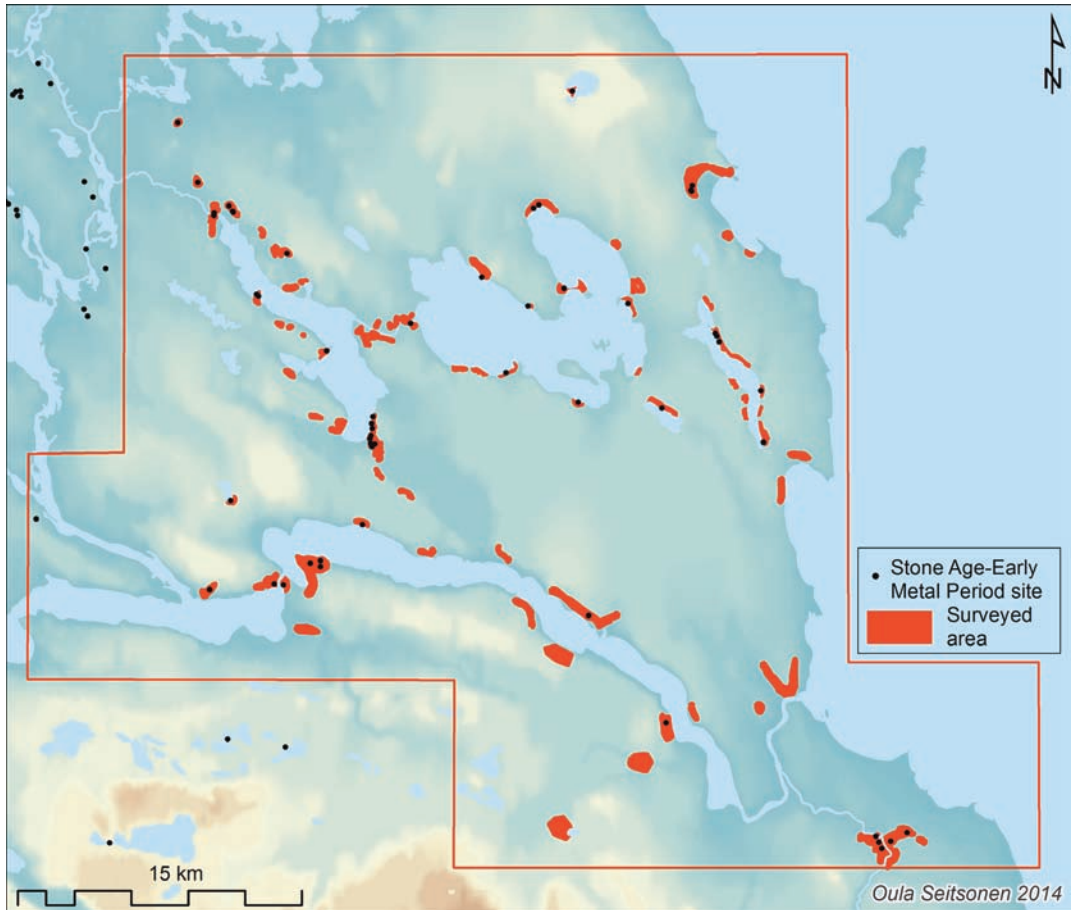
Old municipality	No	Site name (Fi.)	Site name (Ru.)	Site type	Located	Dating 1	Dating 2*	Find material**	House pits	Site type†
Pyhäjärvi	P12	Vanhasniemi 1	Gusinoye 2	Site	2005	Neolithic	MN	Lithics; CW2; burned bone	1	1
Pyhäjärvi	P13	Vanhasniemi 2	Gusinoye 3	Site	2005	Stone Age–Early Metal Period		Lithics; burned bone	No	2
Pyhäjärvi	P14	Vanhasniemi 3	Gusinoye 4	Site	2005	Neolithic	LN	Lithics; Asb; Org; burned bone	No	1
Pyhäjärvi	P15	Kunnanniemi	Komsomol'skoye 3	Site	2005	Multi-period	LM; EN; MN; LN; EMP	Lithics (incl. flint blades); CW1; CW2; Asb (Pöllä); Org; CoW; TXT	2 (–3?)	1
Pyhäjärvi	P16	Honkaniemi 1	Komsomol'skoye 1	Site	2005	Neolithic	MN?	Lithics; CW2?; burned bone	No	1
Pyhäjärvi	P17	Haukaniemi	Otradnoye 1	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P18	Luuvonkorva	Gusinoye 5	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P19	Honkaniemi 2	Komsomol'skoye 2	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P20	Haapaniemi	Otradnoye 4	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P21	Ihantola	Mel'nichniy ruchey	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P22	Volganranta	Otradnoye 5	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P23	Rantapelto	Otradnoye 6	Lithic find location	2005	Mesolithic	LM	Leaf-shaped slate point	No	2
Pyhäjärvi	P24	Rahkajärvi	Naryadnoye 1	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2

Old municipality	No	Site name (Fi.)	Site name (Ru.)	Site type	Located	Dating 1	Dating 2*	Find material**	House pits	Site type†
Pyhäjärvi	P25	Taipale	-	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P26	Mahoinen	Otradnoye 2	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P27	Ristilä 1b	-	Site	2006	Stone Age–Early Metal Period		Lithics; burned bone	No	2
Pyhäjärvi	P28	Suuri Hassinlampi	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P29	Luukkasenmäki 1	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P30	Luukkasenmäki 2	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P31	Luukkasenmäki 3	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P32	Keljanlahti 1	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	1
Pyhäjärvi	P33	Keljanlahti 2	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P34	Myllysuu	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P35	Luukonnitty 1	-	Site	2008	Stone Age–Early Metal Period		Lithics	No	2
Pyhäjärvi	P36	Luukonnitty 2	-	Hunting pits	2008	Stone Age–Early Metal Period?		-	No	-
Pyhäjärvi	P37	Kaasalanmäki	-	Site	2008	Neolithic	MN?	Lithics; ceramics	No	1
Pyhäjärvi	P38	Kuoppalampi	-	Site	2010	Stone Age–Early Metal Period		Lithics; burned bone	No	2
Sakkola	S1	Kiviniemen koski	-	Site	1920	Neolithic		Lithics; ceramics	No	?
Sakkola	S2	Valkjärvi	-	Site	1929	Neolithic	MN	Lithics; CW2:1; burned bone	No	2
Sakkola	S3	-	Portovoye	Site	2003	Neolithic	LN	Lithics; Asb	No	1

Old municipality	No	Site name (Fi.)	Site name (Ru.)	Site type	Located	Dating 1	Dating 2*	Find material**	House pits	Site type†
Sakkola	S4	Metsänlaita	-	Lithic & ceramic find location	2005	Neolithic	EN	Lithics; CW1	No	2
Sakkola	S5	Hotel Losevskaya	-	Lithic find location	2008	Stone Age–Early Metal Period		Lithics	No	2
Sakkola	S6	Röykynniemi	-	Site	2008	Stone Age–Early Metal Period		Lithics; burned bone	No	2
Sakkola	S7	Röykkylä	-	Site	2008	Mesolithic	LM?	Lithics	No	1
Sakkola	S8	Lehtisenniemi	-	Lithic find location	2008	Stone Age–Early Metal Period		Lithics	No	2
Sakkola	S9	Syrinpalle 1	-	Lithic find location	2008	Stone Age–Early Metal Period		Lithics	No	2
Metsäpirtti	M1	-	Vyun 1	Site	1961	Multi-period	MN; LN	Lithics; CW2; Org	No	1
Metsäpirtti	M2	-	Vyun 2	Site	1961	Multi-period	MN; LN	Lithics; CW2; Org	No	1
Metsäpirtti	M3	Viisjoki	-	Site	2008	Mesolithic	EM	Lithics (flint blades)	No	1
Metsäpirtti	M4	Lääväkylä	-	Lithic find location	2008	Stone Age–Early Metal Period		Lithics; burned bone	No	2
Metsäpirtti	M5	Raasnia	-	Lithic find location	2008	Stone Age–Early Metal Period		Lithics	No	2
Vuoksela	V1	-	Romashki	Site	2003	Neolithic	MN	Lithics; CW2	No	1
Vuoksela	V2	Kottilan Lehtiniemi	-	Lithic find location	2005	Stone Age–Early Metal Period		Lithics	No	2
Räisälä	R49	Kaurikangas	-	Lithic find location	2004	Stone Age		Lithics	No	2

Appendix 3

Areas surveyed by the Lake Pyhäjärvi – Ozero Otradnoe project in 2005–2008.



Appendix 4

Sites excavated by the Lake Pyhäjärvi – Ozero Otradnoe project in 2006.

In addition to surveys, small-scale test excavations were conducted in July 2006. These investigations took place at six sites located in the Lake Kiimajärvi and Lake Yläjärvi areas. The aim was to acquire more datable material than could be found during the surveys, as well as to carry out preliminary research at sites located both by a fjord-like lake connected to Lake Ladoga (sites P3, P15) and localities by a small inner lake (sites P11, P12, P14, P27). Due to the limited resources and time, only small test pits (between 1 x 1 and 1 x 3 m) were opened; altogether ca. 32 m² were excavated, excluding phosphate corings. The biggest surprise was the Kunnianniemi site, where nearly 3-m-thick archaeological deposits were discovered (Figs. 7–9) – research at this location was continued the following year with additional excavations. A comprehensive analysis of the Kunnianniemi excavations will be presented elsewhere. Here, only the observations made in 2006 are briefly described and supplemented by the radiocarbon datings from the site (also Gerasimov et al. 2007; 2008; Nordqvist & Seitsonen 2009; Seitsonen et al. 2009; 2012). The Russian names for the sites are given in parentheses.

1 Porsaanmäki 1 (Komsomol'skoye 9; P3)

In 2005, three house pits were discovered on the south-west shore of Lake Kiimajärvi. The largest of these (house pit 1, 13 x 10 x 0.4 m in size), was situated on a fossilised shore terrace (ca. 21 m a.s.l.), whereas the two other house pits (2 and 3, 11 x 8 x 0.4 m and 9 x 8 x 0.3 m) were situated on a lower terrace (ca. 19 m a.s.l.). All house pit measurements were made from the fall-off point on the inside of the wall embankment (Fig. 7). A test pit (3 x 1 m) was opened just outside the northern wall of house pit 1, revealing two distinct cultural layers (Fig. 8a). The upper cultural layer, ca. 10–15 cm thick, can be connected with the late phases of the Comb Ware tradition, i.e. the se-

cond half of the 4th millennium BC, based on pottery finds and supported by a radiocarbon dating (4390±35 BP; Hela-1821) from charcoal found in a pit feature in the cultural layer (Fig. 8a: 1; see also Seitsonen et al. 2012: 112). Other finds consist of quartz and flint. Based on the lithic finds, the lower cultural layer, ca. 20–25 cm in thickness, is Mesolithic: the diagnostic finds included an end-scraper and a wide blade fragment of (Cretaceous) black flint. Thus, at least two occupation phases can be distinguished at the site.

Another test pit (2 x 1 m) was excavated on the lower terrace west of house pit 2. Unfortunately no datable material was obtained from this pit: the finds consisted of a few quartz flakes, and only very vaguely coloured and patchy (washed) cultural soil was observed. Further, decreasing P values in phosphate mapping suggested that the house pits on the lower terrace have been inundated, apparently by the Ladoga transgression that took place before 1350 BC (see Saarnisto 2008; Subetto 2009).

2 Kunnianniemi (Komsomol'skoye 3; P15)

The site is located on the western shore of Lake Kiimajärvi, on the tip of a large, east-protruding cape. In 2005, some Late Neolithic/Early Metal Period finds were discovered in trial soundings made on the flat tip of the cape (ca. 19–20 m a.s.l.). The site is restricted towards the lake by fossilised shore banks; on the inland side, there is a large natural depression bordered by a shore wall, which had also been utilised and altered by humans. In addition, in 2006, a possible house pit (9 x 7.5 x 0.4 m) was found in the background of the site, on a higher terrace (ca. 24 m a.s.l.; see Fig. 7).

In 2006, three trenches were dug at the site. The first of these, trench 1/2006, sized 1 x 3 m, was opened in the flat area on the tip of the cape. In this trench, altogether four cul-

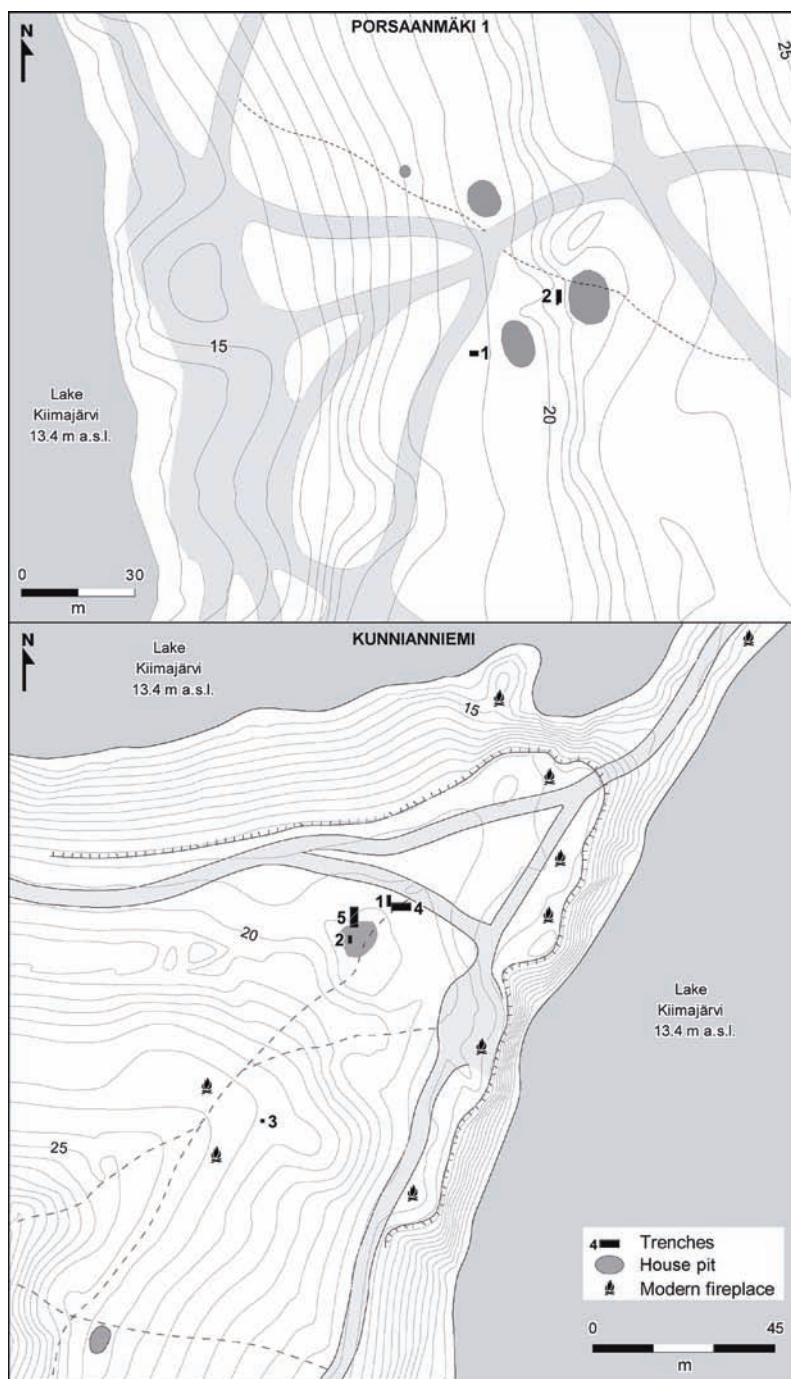


Figure 7. General maps of Porsaanmäki 1 (top); and Kunnianniemi (bottom). Illustration: O. Seitsonen.

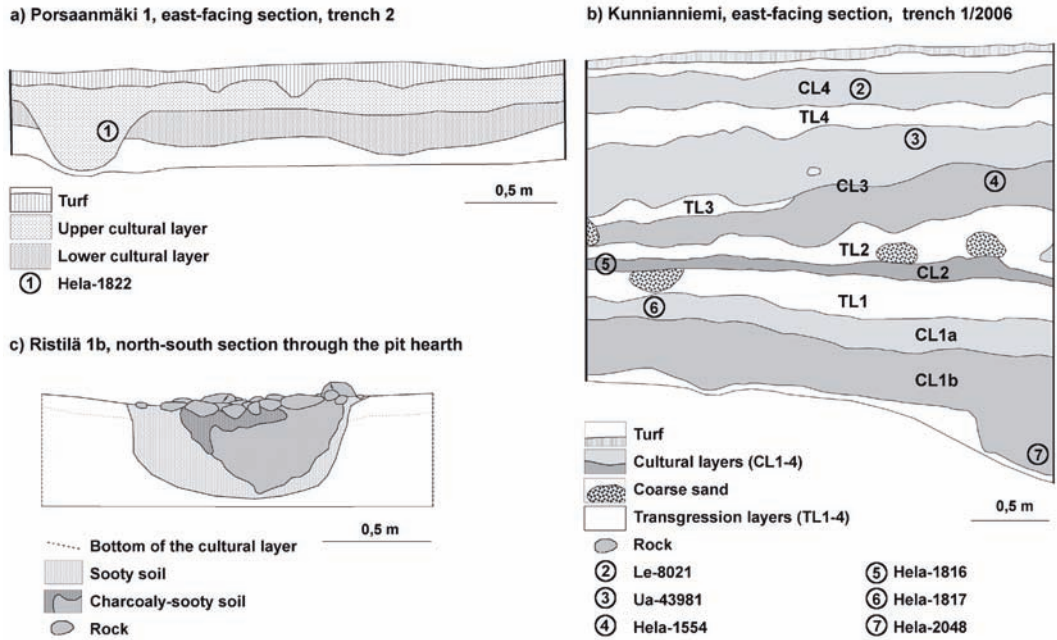


Figure 8. Excavated sections: a – Porsaanmäki 1, trench 2; b – Kunnianniemi, trench 1/2006; c – Ristilä 1b, cross-section of the pit hearth. For Porsaanmäki 1 and Kunnianniemi also the AMS dates (1–7) acquired from the illustrated trenches are presented; four more AMS dates from Kunnianniemi originate from trench 5/2007 (see Seitsonen et al. 2012 for details of the radiometric dates). Illustration: O. Seitsonen.



Figure 9. D. V. Gerasimov documenting trench 1/2006 at Kunnianniemi (left); and excavations underway at Vanhasniemi 3 in 2006, from left to right S. Louzolo, D. V. Gerasimov, L. Kunnas-Pusa, and K. Nordqvist (right). Photos: O. Seitsonen.

tural layers with interlaying transgression sediments were discovered (Figs. 8 & 9). The uppermost cultural layer (CL4; ca. 19.5 m a.s.l.) was found under the topsoil and was 15–20 cm thick. Based on pottery, the layer dates to the Early Metal Period, and charcoal collected and dated from this layer gave a similar age (1720±45 BP; Le-8021; Fig. 8b: 2).

Under the cultural layer, there was a thick sterile sand layer (TL4), which can be reliably connected with the culmination of the Ladoga transgression. This transgression layer was underlain by the next cultural layer (CL3; ca. 19 m a.s.l.), nearly 50 cm thick. This layer can be divided into two components, Middle and Late Neolithic, both represented by the so-called asbestos-tempered and organic-tempered wares. These components have been to some extent mixed by transgressive episodes, but in parts of the trench they are separated by lenses of clean sand (TL3).

The uppermost reach of the Late Neolithic deposit is connected with organic-tempered Corded Ware with e.g. feather and fibrous tempers; there is one radiocarbon date from this context (3828±33 BP; Ua-43981; charcoal; Fig. 8b: 3). The lower portion of the Late Neolithic context (studied mostly in 2007) is connected with Pöljä Ware, and was dated accordingly (4030±35 BP; Hela-1819; and 3955±35 BP; Hela-1844; charred crust on a Pöljä sherd and a burned bone). In further investigations (2007), also more pottery connected with Corded Ware was found in the Late Neolithic context. The lowermost, Middle Neolithic part of this deposit is linked with Kierikki Ware or its contemporaries; a dating made on the birch bark wrapping of a net sinker (4450±35 BP; Hela-1554; Fig. 8b: 4) belongs to this habitation phase.

Another layer of clean transgression sand (TL2) separated this cultural layer from the next one. This Middle Neolithic layer (CL2; ca. 18.5 m a.s.l.) clearly belongs to the Typical Comb Ware phase based on the ceramics and other finds (such as lithics dominated by imported flint) and a dating made on charred crust on pottery (4930±35 BP; Hela-1816; Fig. 8b: 5). The transgression layer (TL1) consisting of coarse

sand underneath the Middle Neolithic layer probably represents the major flood caused by the outburst of the Vuoksi River (dated varying between 3800 and 4200 BC; see Donner & Delusin 1995; Oinonen et al. 2014; Saarnisto 2008; see also Mökkönen & Nordqvist 2014).

The lowermost cultural layer (CL1; 17–18 m a.s.l.) was 30–65 cm thick and also contained two components. The upper part is Early Neolithic (CL1a) and belongs in general to the context of Sperrings Ware (5635±45 BP; Hela-1817; crust on Pit-Comb Ware pottery sherd; Fig. 8b: 6; see also Seitsonen et al. 2009), whereas the lower part is Late Mesolithic (CL1b) (7195±45 BP; Hela-1842; 7025± BP; Hela-1843; and 7077±49 BP; Hela-2048; all burned bone; Fig. 8b: 7).

In addition to this trench, another trench (2/2006; 2 x 1 m) was opened inside the large natural depression. Finds from this area belong mostly to the Early Neolithic, but also later Stone Age material was present: observations in this trench and in the ones excavated in 2007 (Fig. 7: trenches 4–5) suggest that this natural depression behind a shoreline embankment was modified into a large house pit.

The third test square (3/2006; 1 x 1 m) was opened on the higher terrace, towards the house pit observed there. The few finds belong to the Typical Comb Ware period and may indicate habitation in the time right after the breakthrough of the Vuoksi River when the lower terrace was submerged.

3 Ristilä 1a (Gusinoye 6; P11)

This site is located at the south-eastern end of Lake Yläjärvi, just north of a small brook currently discharging from the lake into Lake Ladoga. The southern part of the site is located roughly at the current lake level (ca. 26 m a.s.l.), but the terrain rises significantly towards the northern part of the site (ca. 30 m a.s.l.). All in all, the site is ca. 300 m long and 20–40 m wide.

Four test pits (one sized 1 x 3 m and three sized 1 x 1 m) were dug in the southern and middle parts of the site, discovered in 2005. Based on finds, the oldest habitation seems to

be connected with Sperrings Ware, which was found in the southern area (26.5–28 m a.s.l.). In addition to Early Neolithic habitation, also Late Neolithic activities have taken place in the southern part of the site: Corded Ware and pieces of other organic-tempered pottery were found in this area. Two fireplaces were visible on the profiles of the largest test pit. A charcoal dating from one of these hearths, however, gave a Late Mesolithic age (7095±45 BP; Hela-1822). No finds undisputedly connected with this period were found, but the use of the southern area as a meadow has caused some mixing of the upper soils. In addition, a distinct Typical Comb Ware activity area was located in the middle part of the site (ca. 29 m a.s.l.), with the cultural layer reaching a thickness of 50 cm. Also a piece of asbestos-tempered, Pöljä-like pottery and some unidentifiable organic-tempered sherds were found.

4 Ristilä 1b (Gusinoye 6; P27)

During the 2006 excavations, a new find area was found north of Ristilä 1a. This is called Ristilä 1b in the Finnish reports, but combined with Ristilä 1a in the Russian register. Ristilä 1b is separated from Ristilä 1a by an area devoid of finds and with low phosphate values. The site is badly damaged by recent human activities and heavy shore erosion. A dark, sooty spot was observed on the steep, eroded shore bank, and a trench (2.5 x 1 m) was consequently opened here. Excavations revealed a textbook example of a small stone-filled pit hearth (e.g. Okkonen 2003: 212; Vikkula 1993) and a weak cultural layer. The structure had been some 50 cm deep, round in shape, and ca. 80–90 cm in diameter (Fig. 8c). Its bottom was roundish and the pit was packed with stones and pebbles of 10–20 cm in diameter. The amount of charcoal and signs of fire on the stones and in the sand were fairly limited, so it is possible that the structure had been used only once or twice. Unfortunately its dating remains open, as no finds apart from a few undatable quartzes and burned bones were made and there are no radiocarbon dates

5 Vanhasniemi 1 (Gusinoye 2; P12)

The site was found in 2005 in a modern camping place located at the base of a larger cape on the north-eastern shore of Lake Yläjärvi, ca. 28 m a.s.l. Two trenches (both 1 x 3 m in size) were later opened in the area. Finds were very fragmentary and consisted almost completely of Typical Comb Ware – only a few quartz flakes were found. No clear structures were encountered, and even the cultural layer seemed to be weak and thin (some 10 cm), although it was at least partially disturbed by later human activities. Based on phosphate mapping, the trenches were, nevertheless, located in the most intensively used part of the site. A possible house pit was also observed in the background. Of course, it is possible that much of the site has already eroded into the water – the open shore banks drop steeply 1.5–2 m into the present lake and contained some finds.

6 Vanhasniemi 3 (Gusinoye 4; P14)

The site is located on the eastern shore of Lake Yläjärvi, on top of a heavily eroded shore bank ca. 2 m high. Some finds were collected on this open patch in 2005. In the following year, a trench (ca. 1.5 x 3 m, 28 m a.s.l.) was opened on the shore bank that was under the most acute threat of destruction (Fig. 9). The cultural layer was ca. 15–18 cm thick. Two structures were uncovered despite the small size of the trench: a pit with a diameter of ca. 50 cm, which reached a depth of ca. 25 cm below the top of the cultural layer, and one clear post hole in the middle of the trench. Based on phosphate mapping, the trench was located in the most actively used area of the site, of which only some 15 x 25 m appear to survive – most of the site has already eroded into the lake. Finds consisted of sherds of undecorated pottery tempered with asbestos, chamotte, sand, and/or organic material. This dates the site to the Late Neolithic, the 3rd millennium BC. In addition, a few quartz, flint, and slate flakes and pieces were found.

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